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Interdisciplinary Program for Quantitative Flaw  
Definition Annual Reports

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## Comments from ARPA / AFML

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## Comments from ARPA / AFML

### **Abstract**

I thought it would be appropriate to make a few comments tonight since this week is the third anniversary of this program. I was pretty new with ARPA and these two guys by the name of Don Thompson and this guy he had gotten to, Hike Buckley from the Air Force Materials Laboratory, came in with blazing six guns. They painted such a picture that I was putty in their hands. So we started this program. I went out on thin ice for it with a pretty sizeable sum of money. I have found that it has been worth it over these three years. There have been, however, over these three years so~ ambivalent feelings on my part. How do you measure success? What am I going to say to myself 10-20 years from now; was this program successful or not? I see some signs of success, but I wonder if these successes would have occurred had not ARPA put an investment into the area. I like to feel they wouldn't have been accomplished, but it remains for posterity to show that. Ill! have been fairly successful in getting things implemented into certain services. We have asked Mr. Willoughby to come here tonight from the Navy because the Navy has not been the most successful of the three services. They're not coming in first or second in my book as far as NDE is concerned, but I think when you hear Mr. Willoughby, you're going to hear that Mr. Willoughby has some interesting thoughts on this and I'm convinced if anyone can have an effect, he has a good shot at it.

### **Keywords**

Nondestructive Evaluation

### **Disciplines**

Materials Science and Engineering

COMMENTS FROM ARPA/AFML

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E. van Reuth (ARPA): I thought it would be appropriate to make a few comments tonight since this week is the third anniversary of this program. I was pretty new with ARPA and these two guys by the name of Don Thompson and this guy he had gotten to, Mike Buckley from the Air Force Materials Laboratory, came in with blazing six guns. They painted such a picture that I was putty in their hands. So we started this program. I went out on thin ice for it with a pretty sizeable sum of money. I have found that it has been worth it over these three years. There have been, however, over these three years some ambivalent feelings on my part. How do you measure success? What am I going to say to myself 10-20 years from now; was this program successful or not? I see some signs of success, but I wonder if these successes would have occurred had not ARPA put an investment into the area. I like to feel they wouldn't have been accomplished, but it remains for posterity to show that. We have been fairly successful in getting things implemented into certain services. We have asked Mr. Willoughby to come here tonight from the Navy because the Navy has not been the most successful of the three services. They're not coming in first or second in my book as far as NDE is concerned, but I think when you hear Mr. Willoughby, you're going to hear that Mr. Willoughby has some interesting thoughts on this and I'm convinced if anyone can have an effect, he has a good shot at it.

I am stepping down tonight as the ARPA manager of this program. If there is a moment at which I step down, it is right now. During the last year or year and a half I have looked around for someone to come to ARPA who could manage an aggressive program like this and maximize the benefits. That person is Mike Buckley.

M. J. Buckley (ARPA): This program, I think, has been very successful, but as Ed has said, it is hard to measure the progress. We're working in a broad area. Some of you may not know how much money has been spent. To date about 2.4 million dollars shared by the Air Force and ARPA has been expended for three years of the program. I can say that the Director of ARPA has signed an ARPA order to extend the program to 27 months at a higher level of effort and the Air Force is negotiating, or will be, with Rockwell for that in the near future. Coming back here, this is the fourth meeting for that contract and there are a lot of faces that are now part of the group in NDE who three years ago didn't really know what it was except that it was a source of funding.

I think now we have some real excitement in the field and I think we're facing some of the real critical questions. In particular, the inversion question intrigues me. How do we take a measurement and go back to the source? I expect over the next two years to focus down on some more specific problems in a broad sense so that we can demonstrate new capabilities and yet build some fundamental blocks to get there so that we have a solid base in which to expand and then solve specific problems. From the ARPA viewpoint, I think we're going to be looking in the future towards specific test beds on which to demonstrate technology to show that this quantitative capability, as we bring about pieces of it, can be applied to particular problems with a return on investment. That's really the name of the game in DoD. It's hard to convey how unusual this program is at ARPA. I didn't realize it until I got there. But to run a program for five years of this broad a nature is very unusual. In fact, I don't think there's anything else like that at ARPA at all right now. So, it has been rather unique in many ways and very successful. As the next two years come about I think we are going to be under a lot of pressure to focus in on some specifics that really demonstrate what this technology can do. I'm looking forward to the meeting and to seeing and talking with you again; hopefully, two years from now we really will have done something very impressive. Thank you.

D. O. Thompson (Rockwell International Science Center): Thank you, Mike. I just want to say that I have sincerely appreciated and enjoyed the working relationship that we've had with both yourself and Ed during the course of the three years. It is unusual, I think, to find Program Monitors who contribute technically as well as philosophically to a program, but both of these people have. Right now I'd like to introduce Mr. Don Forney from the Air Force Materials Lab. As you have heard, Mike has left the Air Force and has proceeded on to ARPA, leaving the program monitorship in one of his colleagues' hands, Dr. Rod Panos, at the Air Force Materials Laboratory. Unfortunately, Rod can't be with us tonight, but fortunately, it's because of a good reason. He's expecting an addition to his family. In place of Rod, I'd like to introduce Mr. Don Forney who is head of the NDE branch at the Air Force Materials Laboratory.

D. J. Forney, Jr. (AFML): I think the ultrasonic inspection of Mrs. Panos indicated that the birth would take place at any time now, and Rod, being a good NDE scientist, didn't want to believe that any false predictions could come from that.



inspection; so he decided to stay at home. It's interesting to follow Mike on this podium because he normally would be making the remarks that I'm going to now make; I'll have to check with him later to find out if I said what he would have said. I'd like to comment that from the Air Force's point of view we also feel that this program is an important one. We think it's a unique project in that it's evolving a science base, if you will, to undergoad a fairly old technology area--one which we think was reaching its asymptote in new development opportunities until, as Ed pointed out, Don and Mike undertook the task of trying to develop some activity to put some science under this so-called art area that had evolved over the last 30 or 40 years with totally inadequate progress being made. I'd like, therefore, to add my comments that I think that we can be very happy that people like Don and Mike decided to attack that dragon. I think the success of this program and other science based activities in the future will all owe beginnings to these two guys and the thing that they did. I think that the success and productivity of this program is very important to the future of this kind of activity. A generic project, if I can describe it that way, is very unusual in DoD. It took a large measure of faith in the prospect of success for our management to fund a sizeable program of this type for a considerable length of time. I think productivity and success in the program is very important to its future. The idea of funding institutes or center type programs, if I can characterize them this way, is very out of character in a service organization. Over the years we've tried and failed in many technical subjects to generate interest on the part of our management to put money over the long term to pay for institutional kinds of R&D; yet, we feel that the focus that has been put together on a program like this will create real progress. I think that what has happened in this program is that there's been a lot of stimulation in new thinking within the NDE community. Many science-based people who are not NDE scientists, if there is such a thing, have applied their energies and their thoughts and have stimulated thinking among NDE engineers to think of things as possible that weren't thought possible before. The approaches to typical engineering solutions have been vastly broadened by the science-based kind of work that is represented in this program. Finally, and I think perhaps importantly, renewed expectations on the part of the funding management has come about. NDE was an area that management thought could never face up to the task that it was being called upon to handle. I think that the scientific progress made in this program has really renewed the faith on the part of funding management indicating that, after all, there may be a solution out there. I think that the fact that this program is proceeding on and in the near term has a lot of help is a gratifying thought in the terms of what we might be able to accomplish in NDE and the kind of management attention that we'll get in the future. I'd really like to say that the Air Force has a strong commitment to continue efforts in the science-based area and we hope that other parts of DoD will feel the same way and maybe increase their energies in that direction. We certainly invite the participation on the part of our sister services in focusing their attention toward the fundamental solution to the problem. Again, on behalf of the Air Force

part of the program we are very happy to see so many people here; the fact that the program audience grows each year is gratifying to us. Thank you.